



DEPARTMENT OF THE AIR FORCE
DETACHMENT 3, AIR FORCE INSTITUTE FOR ENVIRONMENT,
SAFETY, AND OCCUPATIONAL HEALTH RISK ANALYSIS (AFMC)
APO AP 96368-5213

16 Feb 02

MEMORANDUM FOR 36 MDOS/SGOAB
Unit 14010, Box 19
APO AP 96543-5000

FROM: Det 3, AFIERA/CDR
Unit 5213
APO AP 96368-5213

SUBJECT: Consultative Letter (CL), IERA-DO-BR-CL-2002-0012, Radio Frequency Radiation Emitter Inventory, 36th Medical Operations Squadron, Bioenvironmental Engineering Flight, Andersen AFB, Guam

1. This consultative letter documents a review and update of Andersen AFB's radio frequency radiation (RFR) emitter database for the 36th Medical Operations Squadron, Bioenvironmental Engineering Flight (36 MDOS/SGOAB). This review examines RF emitters on Andersen AFB to evaluate adequate documentation in accordance with (IAW) AFOSH Standard 48-9, *Radio Frequency Radiation Safety Program*. Enclosed with this letter are updated summary inventory and AF Forms 2759.

2. Personnel Contacted:

<u>Name</u>	<u>Office Symbol</u>	<u>Duty Title</u>
Capt Joseph Vinch	36 MDOS/SGOAB	Chief, Bioenvironmental Engineering Flight
Capt William Belser	36 MDOS/SGOAB	Deputy Chief, Bioenvironmental Engineering Flight

3. The following table lists the points of contact for organizations with radio frequency radiation program requirements:

<u>Workplace ID</u>	<u>Organization</u>	<u>Workplace</u>	<u>POC</u>
016B	36 CS/SCMWF	METNAV	TSgt Roark
016H	36 CS/SCMRB	Base Radio Maintenance	MSgt Johnson
016J	36 CS/SCMO	Weather Radar	TSgt White
016P	36 CS/SCMY	SATCOM/Wideband	SSgt Wheeler
021O	36 MXS/LGMWWC	VACE	SSgt Slama
None	Det 5, 22 SOPS	Integration Office	Steve Layton
None	FAA	FAA	Andreas Mantinova

4. This inventory updated records for 42 ground-based emitters and 1 cruise missile based emitter. The inventory also documents 22 emitters operated by the Federal Aviation Administration (FAA) for awareness purposes only. For each workplace, the following items were accomplished as part of this RFR safety program review:

a. Review and update of RFR emitter inventory records (AF Forms 2759). Attachment 1 contains an updated summary of your RFR inventory. The AF Forms 2759s (Attachments 2-7) list required

protective measures, as well as periodic survey requirements. For all of your emitters, this involves annual checks to ensure that procedures and protective measures (e.g. postings) are still adequate.

b. Review of RFR training records.

c. RFR emitter surveys. RFR emitters were surveyed IAW with AFOSH STD 48-9.

5. Findings: The following paragraphs discuss findings for each of the workplaces with RFR emitters:

a. 36th Communications Squadron (36 CS). A majority of the RFR emitters on Andersen AFB fall under the purview of 36 CS. RFR emitter safety and training requirements are covered by 36 CS Operating Instruction (OI) 48-101, *Radio Frequency Radiation (RFR) Safety Program*. Centralized training is managed and documented through the 36 CS Quality Assurance Office. The following paragraphs outline findings for 36 CS units:

(1) Base Radio Maintenance (36 CS/SCMRB). Base Radio Maintenance maintains 22 radio transceivers at 10 different locations. All of the emitters are short duration emitters thus do not require hazard distance measurements. Personnel use dummy loads during laboratory-based maintenance procedures. These dummy loads were checked for leakage, indicating none. These dummy loads should be checked annually for leakage.

(2) METNAV (36 CS/SCMWF). METNAV maintains flightline based RFR transmitters, including the TACAN, Glideslope Indicator, and the Localizer. Only the TACAN presents a potential hazard, however, a locked hatch prevents access to controlled areas. RFR warning signs on the TACAN tower further protects personnel from inadvertent RFR exposures. Ground level RFR measurements were taken for all METNAV RFR emitters, with no hazardous RFR levels indicated.

(3) Weather Radar (36 CS/SCMO). The Weather Radar flight maintains Andersen AFB's NEXRAD WSR-88D radar, located in building 88 at Barrigada. The radar system potentially emits RFR radiation above limits, however, access to controlled areas are prevented through locked gates and doors. Only RFR safety trained personnel are allowed on-site without an escort. RFR measurements were taken at ground level, near the radar's RFR source and waveguides. No hazardous levels were found. Warning signs were adequate, and, along with waveguide surveys, should be checked annually.

(4) SATCOM/Wideband Maintenance (36 CS/SCMY). SATCOM/Wideband maintains three emitters at three Air Force installations throughout Guam. All of the emitters are short duration emitters, making RFR survey measurements unnecessary. Accuracy of the inventory should be validated annually.

b. 36th Maintenance Squadron, Verification and Check-out Equipment (VACE) conducts maintenance on the conventional air launched cruise missile (CALCM). VACE's RFR emitters are all associated with maintenance of the CALCM's radar altimeter. The three emitters are the radar altimeter, the missile radar altimeter test assembly (MRATA), and the frequency generator used to test the MRATA. Testing the CALCM's radar altimeter uses RFR absorbers to mitigate RFR emissions. The remaining two emitters are considered dummy-loaded processes. Both the RFR absorbers and the waveguides for all procedures were checked for leakage, indicating none. These leakage tests should be repeated on an annual basis.

c. Detachment 5, 22nd Space Operations Squadron (Det 5, 22 SOPS). Det 5 operates two satellite telemetry, tracking, and communications (TT&C) systems. These systems generate hazardous RFR levels, however, access is limited to maintenance personnel, when the systems are powered down.

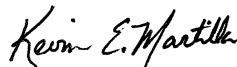
Ground level measurements indicate no hazardous RFR levels in normally accessible areas. RFR emitter operation and maintenance is limited to contract personnel, who conduct internal RFR safety and awareness training.

d. Federal Aviation Administration (FAA). The FAA maintains 22 ground-based emitters on Air Force property throughout Guam. All emitters on facilities where Air Force personnel may be present unattended by knowledgeable FAA escorts are short duration, radio transceivers. These radio transceivers require no additional control to protect Air Force personnel from inadvertent RFR exposure. Regardless, ground level measurements were taken at accessible areas surrounding these emitters, with no hazardous RFR levels found.

6. Recommendations: 36 MDOS/SGOAB should continue annual reviews of workplaces with RFR emitters. Exact hazard control measures are indicated on the AF Forms 2759 for each workplace. At a minimum, this should include:

- a. Verification of the current list of RFR emitters.
- b. Review of training records.
- c. Survey of waveguides and dummyloads.
- d. Verification of proper postings and barriers.

7. If you have any questions, please contact me at 634-2636, or by e-mail at kevin.martilla@kadena.af.mil.



KEVIN E. MARTILLA, Maj, USAF, BSC, CHP
Chief, Radiation Services

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1. Andersen AFB RFR Emitter Inventory
2. AF Form 2759, Base Radio Maintenance
3. AF Form 2759, METNAV
4. AF Form 2759, VACE
5. AF Form 2759, Weather Radar
6. AF Form 2759, SATCOM/Wideband
7. AF Form 2759, Det 5, 22 SOPS

cc: HQ PACAF/SGPB
AFIERA/SDRH

Radiofrequency Radiation Emitter Inventory
Andersen AFB, Guam

WP ID	Office Symbol	Office	Contact	Phone	Nomenclature	Description	Location(s)	Quantity	Hazard Control Codes
016H	36 CS/SCMRB	Base Radio Maintenance	MSgt Johnson	366-7183	AN/GRT-21	VHF Transceiver	Bldg 18015	1	SO, CD
016H	36 CS/SCMRB	Base Radio Maintenance	MSgt Johnson	366-7183	AN/GRT-22	VHF/UHF Transceiver	Bldgs 17002, 18015, 23002	4	SO, CD
016H	36 CS/SCMRB	Base Radio Maintenance	MSgt Johnson	366-7183	AN/URC-119	HF/VHF/UHF Transceiver	Bldgs 18006, 20011	2	SO, CD
016H	36 CS/SCMRB	Base Radio Maintenance	MSgt Johnson	366-7183	AN/GRC-171(v)	VHF/UHF Transceiver	Bldgs 2642, 18006, 20011, AOC	8	SO, CD
016H	36 CS/SCMRB	Base Radio Maintenance	MSgt Johnson	366-7183	AN/GRC-211	VHF Radio Set	Bldg 18015	1	SO, CD
016H	36 CS/SCMRB	Base Radio Maintenance	MSgt Johnson	366-7183	AN/TRC-176(v)2	VHF/UHF Radio Set	Bldgs 17002, AOC	4	SO, CD
016H	36 CS/SCMRB	Base Radio Maintenance	MSgt Johnson	366-7183	AN/PRC-113	VHF/UHF Radio Set	Bldgs 18015, 20011	3	SO, CD
016H	36 CS/SCMRB	Base Radio Maintenance	MSgt Johnson	366-7183	AN/ARC-164	UHF Transceiver	Bldg 2510	1	SO, CD
016H	36 CS/SCMRB	Base Radio Maintenance	MSgt Johnson	366-7183	AN/TRC-187	VHF/UHF Radio Set	Bldgs 17002, 23028, 19028	4	SO, CD
016H	36 CS/SCMRB	Base Radio Maintenance	MSgt Johnson	366-7183	AN/GRC-171(v)4	UHF Radio Set	Bldgs 2510, 20011	4	SO, CD
016B	36 CS/SCMWF	METNAV	TSgt Roark	366-4201	AN/FRN-45	TACAN	Bldg 2800	1	WS, SC
016B	36 CS/SCMWF	METNAV	TSgt Roark	366-4201	AN/GRN-31	ILS Glideslope	Bldg 2661	1	NR
016B	36 CS/SCMWF	METNAV	TSgt Roark	366-4201	AN/GRN-30	ILS Localizer	Bldg 2861	1	NR
021O	36 MXS/LGMWWC	Verification and Equipment Checkout	SSgt Slama	366-3029	CALCM Radar Altimeter	Radar Altimeter Test with RFR Absorption Hood	Bldg 5109	1 per missile	SO, WS, CW
021O	36 MXS/LGMWWC	Verification and Equipment Checkout	SSgt Slama	366-3029	CALCM Radar Altimeter	Radar Altimeter Test to Missile Radar Altimeter Test Assembly	Bldg 5109	1 per missile	SO, CW
021O	36 MXS/LGMWWC	Verification and Equipment Checkout	SSgt Slama	366-3029	Frequency Generator	Frequency Generator Calibration of MRATA	Bldg 5109	1	SO, CW
016J	36 CS/SCMO	Weather Radar	TSgt White	366-7237	WSR-88D	NEXRAD Weather Radar	Barrigada, Bldg 88	1	WS, CF, SC, CW
016P	36 CS/SCMY	SATCOM Wideband Maintenance	SSgt Wheeler	366-2244	Motorola Starpoint	Microwave Transceiver	Mt Santa Rosa, Bldg 70; Nimitz Hill High School	2	NR
016P	36 CS/SCMY	SATCOM Wideband Maintenance	TSgt Abalon	366-2244	AN/GSC-42	UHF SATCOM	Bldg 18000	1	NR
None	Det 5, 22 SOPS	Integration Office	Steve Layton	355-9165	TT&C-46	Satellite Telemetry, Tracking, and Communications System	NW Field	1	CO, FL, WS, SC, CW
None	Det 5, 22 SOPS	Integration Office	Steve Layton	355-9165	TT&C-60	Satellite Telemetry, Tracking, and Communications System	NW Field	1	CO, FL, WS, SC, CW
FAA	FAA	FAA	Andreas Mantinova	366-5252	AN/GRT-21	VHF Transceiver	Bldg 19010	1	NR
FAA	FAA	FAA	Andreas Mantinova	366-5252	AN/GRT-22	VHF/UHF Transceiver	Bldg 19010	1	NR
FAA	FAA	FAA	Andreas Mantinova	366-5252	ARSR-4	Enroute Radar	Mt Santa Rosa, Bldg 72	1	NR
FAA	FAA	FAA	Andreas Mantinova	366-5252	ASR-8	Terminal Radar	Mt Santa Rosa, Bldg 72	1	NR
FAA	FAA	FAA	Andreas Mantinova	366-5252	ATCBI-5	Secondary Radar	Mt Santa Rosa, Bldg 72	1	NR
FAA	FAA	FAA	Andreas Mantinova	366-5252	Low Density RCL	Low Density RCL	RC4	2	NR
FAA	FAA	FAA	Andreas Mantinova	366-5252	Low Density RCL	Low Density RCL	SR8	1	NR
FAA	FAA	FAA	Andreas Mantinova	366-5252	Low Density RCL	Low Density RCL	Bldg 18011	1	NR
FAA	FAA	FAA	Andreas Mantinova	366-5252	Motorola	VHF/UHF Transceiver (Enroute Radio)	RC4	12	NR
FAA	FAA	FAA	Andreas Mantinova	366-5252	Motorola PET 2000	VHF/UHF Transceiver	Bldg 18011	1	NR

Note:

FAA Emitters included for awareness only, Air Force personnel do not access FAA controlled areas without escort by FAA personnel, who are knowledgeable of the RF hazards. There are no hazardous RFR levels in accessible areas surrounding these emitters.

Hazard Control Codes:

AS-Audible Signal; BA-Rope or Chain Barrier; CA-Check RF Absorbers; CD-Check Dummy Loads; CO-Constant Observation; CW-Check Waveguides; FE-Fence; FL-Flashing Lights; LF-Locked Fence; SC-Special Coordination; SO-SOP; WS-Warning Sign; NR-No Control Required; OM-Other

RADIOFREQUENCY EMITTER SURVEY		DATE (DD MMM YY) 07 Feb 02		WORKPLACE IDENTIFIER -016H	
		BASE Andersen AFB		ORGANIZATION 36 CS	
		WORKPLACE Base Radio Maintenance			
		BLDG NO/LOCATION 20011		ROOM/AREA	
NAME OF CONTACT	GRADE	POSITION	ORGANIZATION/OFFICE SYMBOL		DUTY PHONE
Johnson	MSgt	NCOIC	36 CS/SCMRB		366-7183
HAZARD EVALUATION AND CONTROL DATA					
NOMENCLATURE	AN/GRC-171(v)	AN/URC-119	AN/GRT-21	AN/GRT-22	
DESCRIPTION	UHF TRANSCEIVER	HF TRANSCEIVER	VHF TRANSMITTER	UHF TRANSMITTER	
LOCATION OF EMITTERS	Bldgs 2642, 18006, 20011, AOC	20011, 18006	Bldg 18015	Bldgs 18015, 23002, 17002	
QUANTITY	8	2	1	4	
FREQUENCY (MHZ)	225-400	1.6-30	116-150	225-400	
PULSE WIDTH (microsec.)	CW	CW	CW	CW	
PULSE REPETITION FREQUENCY (pps)	CW	CW	CW	CW	
PEAK POWER (KW)	0.02	0.5	0.05	0.05	
ANTENNA CODE	DP or DL	WH or DL	DP or DL	DP or DL	
ANTENNA SIZE (ft.) (hor./ver.)	4	30	4	4	
ANTENNA GAIN (dB)	6	2.1	6	6	
SCANNING CODE	F	F	F	F	
SCAN RATE (rpm)	N/A	N/A	N/A	N/A	
PERMISSIBLE EXPOSURE LIMIT (mW/cm2)	cont - 1.0 uncont - 0.2	cont - 1.0 uncont - 0.2	cont - 1.0 uncont - 0.2	cont - 1.0 uncont - 0.2	
ESTIMATED HAZARD DISTANCE (ft)	cont - 2.7 uncont - 5.9	cont - 3.8 uncont - 8.4	cont - 4.1 uncont - 9.2	cont - 4.1 uncont - 9.2	
HAZARD CODE(S)	SH or DL	SH or DL	SH or DL	SH or DL	
HAZARD CONTROL CODE(S)	SO, CD	SO, CD	SO, CD	SO, CD	
HAZARD DISTANCE MEASUREMENTS (ft)	Not required (SH).	Not required (SH).	Not required (SH).	Not required (SH).	
PREPARED BY (Name, Grade, AFSC) KEVIN E. MARTILLA, Maj, USAF, 43Y3		REVIEWED BY (Name, Grade, AFSC)			

PERIODIC CHECKS				
CHECK FREQUENCY		<input checked="" type="checkbox"/> ANNUALLY <input type="checkbox"/> QUARTERLY <input type="checkbox"/> OTHER _____		
DATE (DD MMM YY)	SIGNS CURRENT	PROCEDURES ADEQUATE	OTHER	CHECKED BY
07 Feb 02	Y	Y	No leakage detected in dummy loads.	Maj Martilla

SYSTEM DIAGRAM. CALCULATIONS. AND MEASUREMENTS



The AN/GRC-171 VHF/UHF radio set operates at 225-400 MHz in AM mode and power output of 20 W with a 6 dB antenna gain. It can operate from a power source of 120 or 230 V AC, or 28 V DC. The major component is the RT-980. The PEL is 1.0 mW/cm2 (61.4 V/m) for controlled areas and 0.2 mW/cm2 (27.5 V/m) for uncontrolled areas. The hazard distance is 2.6 feet for controlled areas if used continuously for six minutes and 4.5 feet for uncontrolled areas if used continuously for 30 minutes. RF exposure risk is typically low for these mostly because one has to climb to reach the hazard area and transmit time is far less than six minutes.



GRT-22 UHF Antennas, Bldg 230022



URC-119 HF Transceiver

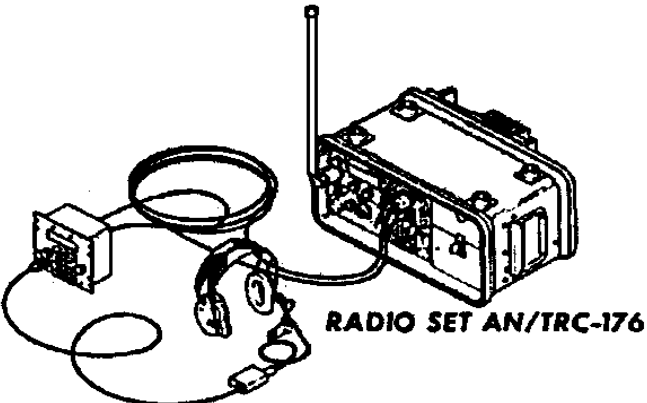
The AN/URC-119 radio set operates at 1.6-30 MHz in 10 Hz increments with 100 front- panel channels. It uses 100 W of power and has 5dB antenna gain. The PEL is 1.0 mW/cm2 (61.4 V/m) for controlled areas and 0.2 mW/cm2 (27.5 V/m) for uncontrolled areas. The hazard distance is 4.9 feet for controlled areas if used continuously for six minutes and 12.2 feet for uncontrolled areas if used continuously for 30 minutes. Since actual use is much less than six minutes, the hazards distances will decrease accordingly.

Hazard Control Codes
AS-Audible Signal; BA-Rope or Chain Barrier; CA-Check RF Absorbers; CD- Check Dummy Load; CO-Constant Observation; CW-Check Waveguides; FE-Fence; FL-Flashing Lights; LF-Locked Fence/Door; SC-Special Coordination; SO-SOP; WS-Warning Sign; NR-No Control Required; OM-Other

RADIOFREQUENCY EMITTER SURVEY		DATE (DD MMM YY) 07 Feb 02		WORKPLACE IDENTIFIER -016H	
		BASE Andersen AFB		ORGANIZATION 36 CS	
		WORKPLACE Base Radio Maintenance			
		BLDG NO/LOCATION 20011		ROOM/AREA	
NAME OF CONTACT	GRADE	POSITION	ORGANIZATION/OFFICE SYMBOL		DUTY PHONE
Johnson	MSgt	NCOIC	36 CS/SCMRB		366-7183
HAZARD EVALUATION AND CONTROL DATA					
NOMENCLATURE	AN/GRC-211	AN/TRC-176(v)2	AN/PRC-113(v)3	AN/ARC-164	
DESCRIPTION	VHF Radio Set	VHF/UHF Radio Set	VHF/UHF Radio Set	UHF Radio Set	
LOCATION OF EMITTERS	Bldg 18015	Bldgs 17002, AOC	Bldgs 18015, 20011	Bldg 2510	
QUANTITY	1	4	3	1	
FREQUENCY (MHZ)	116-151	116-400	116-400	225-400	
PULSE WIDTH (microsec.)	CW	CW	CW	CW	
PULSE REPETITION FREQUENCY (pps)	CW	CW	CW	CW	
PEAK POWER (KW)	0.025	0.01	0.01	0.01	
ANTENNA CODE	OD or DL	OD or DL	OD or DL	OD or CL	
ANTENNA SIZE (ft.) (hor./ver.)	4	4	4	4	
ANTENNA GAIN (dB)	1	1	1	1	
SCANNING CODE	F	F	F	F	
SCAN RATE (rpm)	NA	NA	NA	NA	
PERMISSIBLE EXPOSURE LIMIT (mW/cm2)	cont - 1.0 uncont - 0.2	cont - 1.0 uncont - 0.2	cont - 1.0 uncont - 0.2	cont - 1.0 uncont - 0.2	
ESTIMATED HAZARD DISTANCE (ft)	cont - 1.9 uncont - 4.2	cont - 1.7 uncont - 3.7	cont - 1.2 uncont - 2.6	cont - 3.0 uncont - 6.6	
HAZARD CODE(S)	SH or DL	SH or DL	SH or DL	SH or DL	
HAZARD CONTROL CODE(S)	SO, CD	SO, CD	SO, CD	SO, CD	
HAZARD DISTANCE MEASUREMENTS (ft)	Not required (SH).	Not required (SH).	Not required (SH).	Not required (SH).	
PREPARED BY (Name, Grade, AFSC) KEVIN E. MARTILLA, Maj, USAF, 43Y3		REVIEWED BY (Name, Grade, AFSC)			

PERIODIC CHECKS				
CHECK FREQUENCY		<input checked="" type="checkbox"/> ANNUALLY	<input type="checkbox"/> QUARTERLY	<input type="checkbox"/> OTHER _____
DATE (DD MMM YY)	SIGNS CURRENT	PROCEDURES ADEQUATE	OTHER	CHECKED BY
07 Feb 02	Y	Y	No leakage in dummy loads.	Maj Martilla

SYSTEM DIAGRAM. CALCULATIONS. AND MEASUREMENTS



The AN/TRC-176 radio set operates at 116-149.975 MHz and has a 8 W power output. The major component is the RT-1319. The PEL is 1.0 mW/cm2 (61.4 V/m) for controlled areas and 0.2 mW/cm2 (27.5 V/m) for uncontrolled areas. The hazard distance is 1.1 feet for controlled areas if used continuously for six minutes and 2.6 feet for uncontrolled areas if used continuously for 30 minutes. RF exposure risk is typically low for these mostly because the transmit time is far less than six minutes



The AN/PRC-113 radio set operates at 116-149.975 MHz and has a 3 W power output. The major component is the RT-1319. The PEL is 1.0 mW/cm2 (61.4 V/m) for controlled areas and 0.2 mW/cm2 (27.5 V/m) for uncontrolled areas. The hazard distance is 0.6 feet for controlled areas if used continuously for six minutes and 3.8 feet for uncontrolled areas if used continuously for 30 minutes. RF exposure risk is typically low for these mostly because the transmit time is far less than six minutes.

Hazard Control Codes
AS-Audible Signal; BA-Rope or Chain Barrier; CA-Check RF Absorbers; CD- Check Dummy Load; CO-Constant Observation; CW-Check Waveguides; FE-Fence; FL-Flashing Lights; LF-Locked Fence/Door; SC-Special Coordination; SO-SOP; WS-Warning Sign; NR-No Control Required; OM-Other



UHF/VHF Antennas Used for GRC-211

The AN/GRC-211 VHF/UHF radio set operates at 116-149.97 MHz and power output of 32 W with a 6 dB antenna gain. The PEL is 1.0 mW/cm² (61.4 V/m) for controlled areas and 0.2 mW/cm² (27.5 V/m) for uncontrolled areas. The hazard distance is 2.7 feet for controlled areas if used continuously for six minutes and 4.8 feet for uncontrolled areas if used continuously for 30 minutes. RF exposure risk is typically low for these mostly because one has to climb to reach the hazard area and transmit time is far less than six minutes.

RADIOFREQUENCY EMITTER SURVEY		DATE (DD MMM YY) 07 Feb 02		WORKPLACE IDENTIFIER -016H	
				BASE Andersen AFB	
				ORGANIZATION 36 CS	
				WORKPLACE Base Radio Maintenance	
				BLDG NO/LOCATION 20011	ROOM/AREA
NAME OF CONTACT	GRADE	POSITION	ORGANIZATION/OFFICE SYMBOL		DUTY PHONE
Johnson	MSgt	NCOIC	36 CS/SCMRB		366-7183
HAZARD EVALUATION AND CONTROL DATA					
NOMENCLATURE	AN/GRC-171(v)4		AN/TRC-187		
DESCRIPTION	UHF TRANSCEIVER		VHF/UHF Radio Set		
LOCATION OF EMITTERS	Bldgs 2510, 20011		Bldgs 17002, 23028, 19028		
QUANTITY	4		4		
FREQUENCY (MHZ)	225-400		116-400		
PULSE WIDTH (microsec.)	CW		CW		
PULSE REPETITION FREQUENCY (pps)	CW		CW		
PEAK POWER (KW)	0.02		0.025		
ANTENNA CODE	DP or DL		OD or DL		
ANTENNA SIZE (ft.) (hor./ver.)	4		4		
ANTENNA GAIN (dB)	6		1		
SCANNING CODE	F		F		
SCAN RATE (rpm)	N/A		NA		
PERMISSIBLE EXPOSURE LIMIT (mW/cm2)	cont - 1.0 uncont - 0.2		cont - 1.0 uncont - 0.2		
ESTIMATED HAZARD DISTANCE (ft)	cont - 2.7 uncont - 5.9		cont - 2.9 uncont - 6.5		
HAZARD CODE(S)	SH or DL		SH or DL		
HAZARD CONTROL CODE(S)	SO, CD		SO, CD		
HAZARD DISTANCE MEASUREMENTS (ft)	Not required (SH).		Not required (SH).		
PREPARED BY (Name, Grade, AFSC) KEVIN E. MARTILLA, Maj, USAF, 43Y3			REVIEWED BY (Name, Grade, AFSC)		

PERIODIC CHECKS				
CHECK FREQUENCY		<input checked="" type="checkbox"/> ANNUALLY <input type="checkbox"/> QUARTERLY <input type="checkbox"/> OTHER _____		
DATE (DD MMM YY)	SIGNS CURRENT	PROCEDURES ADEQUATE	OTHER	CHECKED BY
07 Feb 02	Y	Y	No leakage detected in dummy loads.	Maj Martilla

SYSTEM DIAGRAM. CALCULATIONS. AND MEASUREMENTS



The AN/GRC-171 VHF/UHF radio set operates at 225-400 MHz in AM mode and power output of 20 W with a 6 dB antenna gain. It can operate from a power source of 120 or 230 V AC, or 28 V DC. The major component is the RT-980. The PEL is 1.0 mW/cm2 (61.4 V/m) for controlled areas and 0.2 mW/cm2 (27.5 V/m) for uncontrolled areas. The hazard distance is 2.6 feet for controlled areas if used continuously for six minutes and 4.5 feet for uncontrolled areas if used continuously for 30 minutes. RF exposure risk is typically low for these mostly because one has to climb to reach the hazard area and transmit time is far less than six minutes.



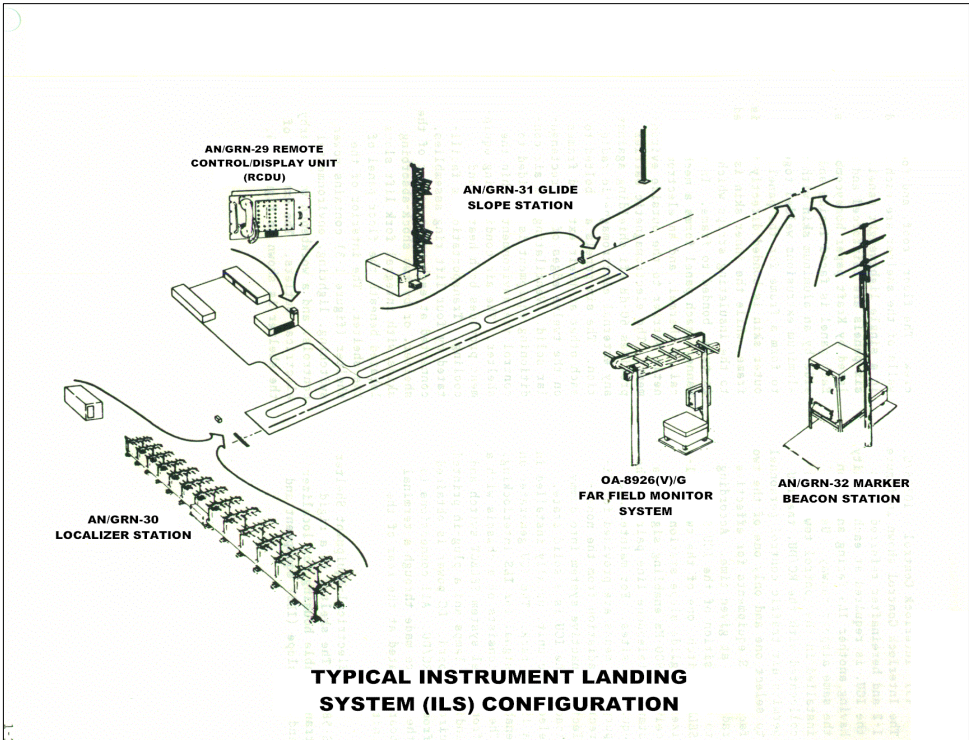
VHF/UHF Antennas, Bldg 17002

Hazard Control Codes
AS-Audible Signal; BA-Rope or Chain Barrier; CA-Check RF Absorbers; CD- Check Dummy Load; CO-Constant Observation; CW-Check Waveguides; FE-Fence; FL-Flashing Lights; LF-Locked Fence/Door; SC-Special Coordination; SO-SOP; WS-Warning Sign; NR-No Control Required; OM-Other

RADIOFREQUENCY EMITTER SURVEY		DATE (DD MMM YY) 07 Feb 02		WORKPLACE IDENTIFIER -0B16	
				BASE Andersen AFB	
				ORGANIZATION 36 CS	
				WORKPLACE METNAV	
				BLDG NO/LOCATION 20011	
				ROOM/AREA	
NAME OF CONTACT	GRADE	POSITION	ORGANIZATION/OFFICE SYMBOL		DUTY PHONE
Roark	TSgt	NCOIC	36 CS/SCMWF		366-4201
Stark	SSgt	Asst. NCOIC	36 CS/SCMWF		366-4201
HAZARD EVALUATION AND CONTROL DATA					
NOMENCLATURE	AN/GRN-31	AN/GRN-30	AN/FRN-45		
DESCRIPTION	ILS GLIDESLOPE	ILS LOCALIZER	TACTICAL NAVIGATION (TACAN)		
LOCATION OF EMITTERS	Bldg 2661	Bldg 2861	Bldg 2800		
QUANTITY	1	1	1		
FREQUENCY (MHZ)	334.4	110.1	1015		
PULSE WIDTH (microsec.)	CW	CW	3.5		
PULSE REPETITION FREQUENCY (pps)	CW	CW	7200		
PEAK POWER (KW)	0.003	0.015	3.4		
ANTENNA CODE	DP	DP	OO		
ANTENNA SIZE (ft.) (hor./ver.)	2 H 4 V	ARRAY	10.3		
ANTENNA GAIN (dB)	25	25	8		
SCANNING CODE	F	F	E-360		
SCAN RATE (rpm)	N/A	N/A	900		
PERMISSIBLE EXPOSURE LIMIT (mW/cm2)	Cont - 1 Uncont - 0.2	Cont - 1 Uncont - 0.2	Cont - 4 Uncont - 0.8		
ESTIMATED HAZARD DISTANCE (ft)	Cont - 1.5 Uncont - 3.4	Cont - 3.6 Uncont - 8.0	Cont - 3.5 Uncont - 7.8		
HAZARD CODE(S)	NH	NH	CH		
HAZARD CONTROL CODE(S)	NR	NR	WS, SC		
HAZARD DISTANCE MEASUREMENTS (ft)	0	0	0		
PREPARED BY (Name, Grade, AFSC) KEVIN E. MARTILLA, Maj, USAF, 43Y3			REVIEWED BY (Name, Grade, AFSC)		

PERIODIC CHECKS				
CHECK FREQUENCY		<input checked="" type="checkbox"/> ANNUALLY	<input type="checkbox"/> QUARTERLY	<input type="checkbox"/> OTHER _____
DATE (DD MMM YY)	SIGNS CURRENT	PROCEDURES ADEQUATE	OTHER	CHECKED BY
07 Feb 02	Y	Y	No RFR above uncont. PELs at ground level.	Maj Martilla

SYSTEM DIAGRAM, CALCULATIONS, AND MEASUREMENTS



Andersen AFB Localizer



Andersen AFB TACAN

Hazard Control Codes
AS-Audible Signal; BA-Rope or Chain Barrier; CA-Check RF Absorbers; CO-Constant Observation; CW-Check Waveguides; FE-Fence; FL-Flashing Lights; LF-Locked Fence; SC-Special Coordination; SO-SOP; WS-Warning Sign; NR-No Control Required; OM-Other



GRN-31 Antenna



GRN-31 Cabinet

AN/GRN-31 Null Reference Glide Slope Station. This glide slope station provides final approach glide path information to landing aircraft. To provide glide path information for this instrument landing system, the glide slope station generates two RF signals: an RF carrier signal modulated at 90 and 150 Hz and double sideband, suppressed carrier signal modulated at 90 and 150 Hz. Two antennas transmit these signals. The resulting signal pattern provides guidance in the vertical plane to approaching aircraft. The transmitted glide slope signal is sampled by probes mounted in the transmitting antennas and also by a near-field monitor detector. Integral detectors and the near-field monitor detector/ antenna detect these sampled signals. The signals are then fed to two monitors, in parallel, for measurement and analysis. If both monitors determine that the glide slope equipment is malfunctioning, an alarm will sound at the remote control/display unit and an alarm indication will be given. When the main transmitter generates the RF signals, this alarm will initiate a transfer to the standby transmitter.

The AN/GRN-30 (V) localizer provides final approach course information to landing aircraft. This information is displayed as a visual indication enabling a pilot to maintain the proper course until visual contact with the runway and the landing is completed. Each localizer transmitter generates two RF signals; an RF carrier with 90 and 150 Hz modulation, and a suppressed carrier double side-band signal. These signals are radiated from a 14-antenna array resulting in a signal pattern that provides guidance in the horizontal plane to aircraft in approaches to and landings at airports. Probes in the antennas sample the transmitted signal which are fed to a detector system that combines them and feeds them to the integral monitors. The monitor compares these signals to preset limits; if they fall outside the limits, an alarm sounds and equipment changeover is initiated. Also, the facility identification ID) code is generated and transmitted by the course transmitter. The capture effect localizer station is a solid-state, two-frequency system with partial redundancy. The station consists of two equipment cabinets and an emergency power source (battery) housed in a transportable shelter, and an antenna array with integral monitoring.



GRN 30 Localizer Shelter

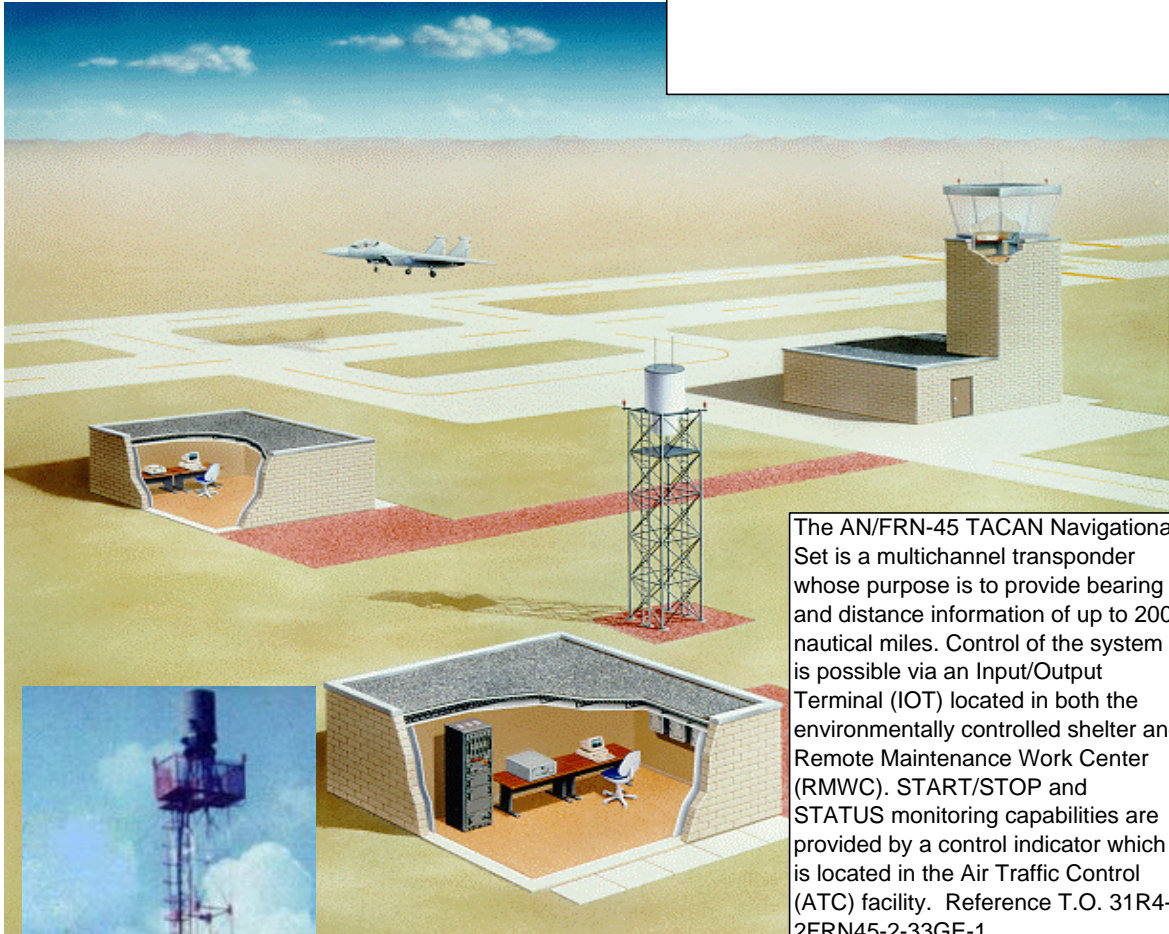


GRN 30 Localizer Antenna



FRN-44 VOR

The AN/FRN-44 VOR Navigational Set consists of a complete Very High Frequency Omnirange (VOR) system. The transmitter group is housed in an environmentally controlled shelter, and the antenna is mounted above the shelter on a counterpoise. The counterpoise is most often the metal roof, but can be an independent structure. Control of the system is possible via an Input/Output Terminal (IOT) located in both the shelter and Remote Maintenance Work Center (RMWC). START/STOP and STATUS monitoring capabilities are provided by a control indicator, which is located in the Air Traffic Control (ATC) facility. Reference T.O. 31R4-2FRN044-2-32GE-1



FRN-45 TACAN

The AN/FRN-45 TACAN Navigational Set is a multichannel transponder whose purpose is to provide bearing and distance information of up to 200 nautical miles. Control of the system is possible via an Input/Output Terminal (IOT) located in both the environmentally controlled shelter and Remote Maintenance Work Center (RMWC). START/STOP and STATUS monitoring capabilities are provided by a control indicator which is located in the Air Traffic Control (ATC) facility. Reference T.O. 31R4-2FRN45-2-33GE-1

RADIOFREQUENCY EMITTER SURVEY		DATE (DD MMM YY) 10 Sep 01		WORKPLACE IDENTIFIER	
				BASE Andersen AFB	
				ORGANIZATION 36 MXS	
				WORKPLACE Verification and Checkout Equipment	
				BLDG NO/LOCATION Bldg 5109	
				ROOM/AREA VACE	
NAME OF CONTACT	GRADE	POSITION	ORGANIZATION/OFFICE SYMBOL		DUTY PHONE
T. Slama	SSgt	NCOIC, VACE	36 MXS/LGMWWC		366-3029
A. Staniger	SSgt	Section Safety Monitor	36 MXS/LGMWWC		366-3029
HAZARD EVALUATION AND CONTROL DATA					
NOMENCLATURE	CALCM Radar Altimeter	CALCM Radar Altimeter	Frequency Generator		
DESCRIPTION	Radar Altimeter Test with RFR Absorption Hood	Radar Altimeter Test to Missile Radar Altimeter Test Assembly (MRATA)	Frequency Generator Calibration of MRATA		
LOCATION OF EMITTERS	Bldg 5109	Bldg 5109	Bldg 5109		
QUANTITY	1 per cruise missile	1 per cruise missile	1		
FREQUENCY (MHZ)	5000	5000	5000		
PULSE WIDTH (microsec.)	0.5	CW	CW		
PULSE REPETITION FREQUENCY (pps)	2000	CW	CW		
PEAK POWER (KW)	0.01	0.02	0.4		
ANTENNA CODE	RR	DL	DL		
ANTENNA SIZE (ft.) (hor./ver.)	0.33 X 0.33 ft	DL	DL		
ANTENNA GAIN (dB)	10	NA	NA		
SCANNING CODE	F	F	F		
SCAN RATE (rpm)	NA	NA	NA		
PERMISSIBLE EXPOSURE LIMIT (mW/cm2)	Cont - 10 Uncont - 3.33	Cont - 10 Uncont - 3.33	Cont - 10 Uncont - 3.33		
ESTIMATED HAZARD DISTANCE (ft)	Cont - 0.03 Uncont - 0.05	Cont - 0.01 Uncont - 0.02	Cont - 0.01 Uncont - 0.02		
HAZARD CODE(S)	GH	DL	DL		
HAZARD CONTROL CODE(S)	SO, WS. CA	SO, CW	SO, CW		
HAZARD DISTANCE MEASUREMENTS (ft)					
PREPARED BY (Name, Grade, AFSC) KEVIN E. MARTILLA, Maj, USAF, BSC			REVIEWED BY (Name, Grade, AFSC)		

PERIODIC CHECKS				
CHECK FREQUENCY <input checked="" type="checkbox"/> ANNUALLY <input type="checkbox"/> QUARTERLY <input type="checkbox"/> OTHER _____				
DATE (DD MMM YY)	SIGNS CURRENT	PROCEDURES ADEQUATE	OTHER	CHECKED BY
07 Feb 02	Y	Y	RFR absorption hoods checked for leakage.	Maj Martilla

SYSTEM DIAGRAM, CALCULATIONS, AND MEASUREMENTS

Boeing AGM-86C, Conventional Air Launched Cruise Missile

36 MXS/LGMWWC, Verification and Checkout Equipment Section, performs maintenance on the AGM-86C, including periodic checks on missiles' radar altimeters.

The RFR hazards associated with AGM-86C maintenance stem from the following processes:

1. In-place testing of CALCM radar altimeter antenna. RFR absorption hoods are placed over the missile's antenna.
2. Guidance system test using the missile radar altimeter test assembly (MRATA)
3. Calibration of the MRATA.

The first process poses a ground level hazard only if the RFR absorption hoods leak or are improperly installed. All processes pose a potential ground level hazard if the test assembly wave guides leak RFR.

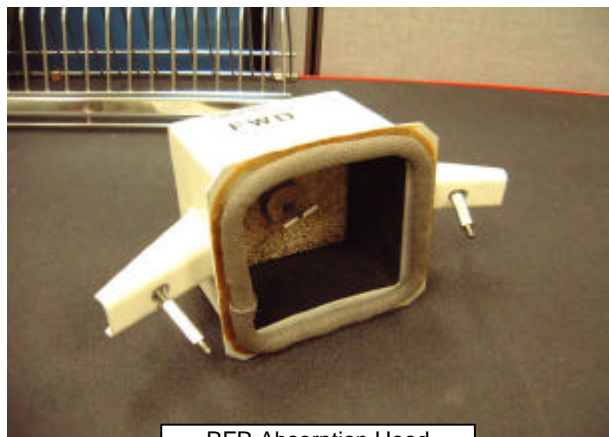
The following control measures should be preformed during an annual workplace site visit:

1. Survey for leakage all absorption hoods and waveguides.
2. Review personnel training records to ensure RFR safety awareness training is accomplished.
3. Verify shop instructions and warning signs are current.

Shop personnel should contact Bioenvironmental Engineering regarding any new or changed process involving RFR.



AGM-86C with RFR
Absorption Hood Attached



RFR Absorption Hood

Hazard Control Codes

AS-Audible Signal; BA-Rope or Chain Barrier; CA-Check RF Absorbers; CO-Constant Observation; CW-Check Waveguides; FE-Fence; FL-Flashing Lights; LF-Locked Fence; SC-Special Coordination; SO-SOP; WS-Warning Sign; NR-No Control Required; OM-Other

RADIOFREQUENCY EMITTER SURVEY		DATE (DD MMM YY) 07 Feb 02		WORKPLACE IDENTIFIER -016J	
				BASE Andersen AFB	
				ORGANIZATION 36 CS	
				WORKPLACE Weather Radar	
				BLDG NO/LOCATION Bldg 20011	
				ROOM/AREA	
NAME OF CONTACT	GRADE	POSITION	ORGANIZATION/OFFICE SYMBOL		DUTY PHONE
White	TSgt	NCOIC	36 CS/SCMO		366-7237
HAZARD EVALUATION AND CONTROL DATA					
NOMENCLATURE	WSR-88D				
DESCRIPTION	NEXRAD Weather Radar				
LOCATION OF EMITTERS	Barrigada, Bldg 88				
QUANTITY	1				
FREQUENCY (MHZ)	2705				
PULSE WIDTH (microsec.)	1.4-4.5				
PULSE REPETITION FREQUENCY (pps)	318-1304				
PEAK POWER (KW)	750				
ANTENNA CODE	CR				
ANTENNA SIZE (ft.) (hor./ver.)	28 ft D				
ANTENNA GAIN (dB)	45.5				
SCANNING CODE	R				
SCAN RATE (rpm)	16-Jun				
PERMISSIBLE EXPOSURE LIMIT (mW/cm2)	cont - 9 uncont - 1.8				
ESTIMATED HAZARD DISTANCE (ft)	cont - 1082 uncont - 2418				
HAZARD CODE(S)	IH				
HAZARD CONTROL CODE(S)	WS, LF, SC, CW				
HAZARD DISTANCE MEASUREMENTS (ft)	Not Required				
PREPARED BY (Name, Grade, AFSC) KEVIN E. MARTILLA, Maj, USAF, 43Y3			REVIEWED BY (Name, Grade, AFSC)		

PERIODIC CHECKS				
CHECK FREQUENCY		<input checked="" type="checkbox"/> ANNUALLY <input type="checkbox"/> QUARTERLY <input type="checkbox"/> OTHER _____		
DATE (DD MMM YY)	SIGNS CURRENT	PROCEDURES ADEQUATE	OTHER	CHECKED BY
07 Feb 02	Y	Y	Waveguides and ground level RFR levels checked.	Maj Martilla

SYSTEM DIAGRAM, CALCULATIONS, AND MEASUREMENTS



Tower Barrier And Sign



NEXRAD WSR-88D Weather Radar



Exterior Waveguides



RFR Source Cabinet

Hazard Control Codes
AS-Audible Signal; BA-Rope or Chain Barrier; CA-Check RF Absorbers; CO-Constant Observation; CW-Check Waveguides; FE-Fence; FL-Flashing Lights; LF-Locked Fence; SC-Special Coordination; SO-SOP; WS-Warning Sign; NR-No Control Required; OM-Other

RADIOFREQUENCY EMITTER SURVEY		DATE (DD MMM YY) 04 Feb 02		WORKPLACE IDENTIFIER -016P	
				BASE Andersen AFB	
				ORGANIZATION 36 CS	
				WORKPLACE SATCOM/Wideband Maintenance	
				BLDG NO/LOCATION 20011	
				ROOM/AREA	
NAME OF CONTACT	GRADE	POSITION	ORGANIZATION/OFFICE SYMBOL		DUTY PHONE
Wheeler	SSgt	NCOIC	36 CS/SCMY		366-2244
HAZARD EVALUATION AND CONTROL DATA					
NOMENCLATURE	Motorola Starpoint		AN/GSC-42		
DESCRIPTION	Microwave Transceiver		UHF SATCOM Transceiver		
LOCATION OF EMITTERS	Mt Santa Rosa, Bldg 70; Nimitz Hill High School		Bldg 18000		
QUANTITY	2		1		
FREQUENCY (MHZ)	1700-1900		225-400		
PULSE WIDTH (microsec.)	CW		CW		
PULSE REPETITION FREQUENCY (pps)	CW		CW		
PEAK POWER (KW)	0.001		0.89		
ANTENNA CODE	CR		DP		
ANTENNA SIZE (ft.) (hor./ver.)	2 ft D		5 x 5		
ANTENNA GAIN (dB)	113.5		14		
SCANNING CODE	F		F		
SCAN RATE (rpm)	NA		NA		
PERMISSIBLE EXPOSURE LIMIT (mW/cm2)	cont - 5.67 uncont - 1.13		cont - 1.00 uncont - 0.20		
ESTIMATED HAZARD DISTANCE (ft)	cont - 13 uncont - 28		cont - 44 uncont - 98		
HAZARD CODE(S)	SH		SH		
HAZARD CONTROL CODE(S)	NR (SH)		NR (SH)		
HAZARD DISTANCE MEASUREMENTS (ft)	NR (SH)		NR (SH)		
PREPARED BY (Name, Grade, AFSC) KEVIN E. MARTILLA, Maj, USAF, 43Y3			REVIEWED BY (Name, Grade, AFSC)		

PERIODIC CHECKS				
CHECK FREQUENCY		<input checked="" type="checkbox"/> ANNUALLY <input type="checkbox"/> QUARTERLY <input type="checkbox"/> OTHER _____		
DATE (DD MMM YY)	SIGNS CURRENT	PROCEDURES ADEQUATE	OTHER	CHECKED BY

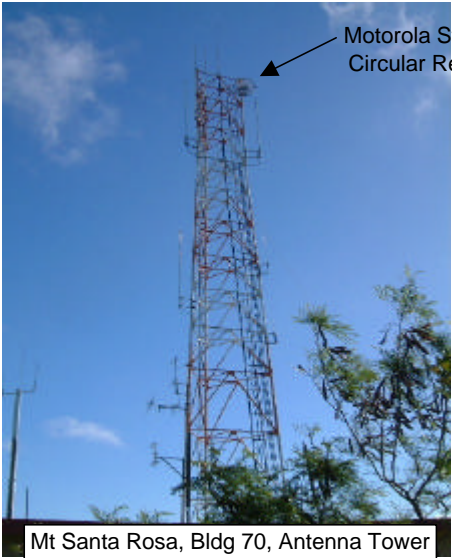
SYSTEM DIAGRAM, CALCULATIONS, AND MEASUREMENTS



GSC-42 Antenna, Crossed Dipole Array
Bldg 18000, Andersen AFB



GSC-42 Antenna, UHF Transceiver Terminal



Mt Santa Rosa, Bldg 70, Antenna Tower

Hazard Control Codes
AS-Audible Signal; BA-Rope or Chain Barrier; CA-Check RF Absorbers; CO-Constant Observation; CW-Check Waveguides; FE-Fence; FL-Flashing Lights; LF-Locked Fence; SC-Special Coordination; SO-SOP; WS-Warning Sign; NR-No Control Required; OM-Other

RADIOFREQUENCY EMITTER SURVEY		DATE (DD MMM YY) 09 Sep 01		WORKPLACE IDENTIFIER None	
			BASE Andersen AFB		ORGANIZATION Det 5, 22 Sops
			WORKPLACE Integration Office		
			BLDG NO/LOCATION	ROOM/AREA NW Field	
NAME OF CONTACT	GRADE	POSITION	ORGANIZATION/OFFICE SYMBOL		DUTY PHONE
Steve Layton			Det 5, 22 SOPS		355-9165
HAZARD EVALUATION AND CONTROL DATA					
NOMENCLATURE	TT&C-46	TT&C-60			
DESCRIPTION	Satellite Telemetry, Tracking, and Communications System	Satellite Telemetry, Tracking, and Communications System			
LOCATION OF EMITTERS	Bldg ???	Bldg ???			
QUANTITY	1	1			
FREQUENCY (MHZ)	1750-1850	1700-1800			
PULSE WIDTH (microsec.)	CW	CW			
PULSE REPETITION FREQUENCY (pps)	CW	CW			
PEAK POWER (KW)	1.66	6.5			
ANTENNA CODE	CR	CR			
ANTENNA SIZE (ft.) (hor./ver.)	46 ft D	60 ft D			
ANTENNA GAIN (dB)	46	43			
SCANNING CODE	F	F			
SCAN RATE (rpm)	NA	NA			
PERMISSIBLE EXPOSURE LIMIT (mW/cm2)	cont - 5.83 uncont - 1.17	cont - 5.67 uncont - 1.13			
ESTIMATED HAZARD DISTANCE (ft)	cont - 700 uncont - 1560	cont - 1993 uncont - 4457			
HAZARD CODE(S)	IH	IH			
HAZARD CONTROL CODE(S)	CO, FL, WS, SC, CW	CO, FL, WS, SC, CW			
HAZARD DISTANCE MEASUREMENTS (ft)	NR (IH)	NR (IH)			
PREPARED BY (Name, Grade, AFSC) KEVIN E. MARTILLA, Maj, USAF, 43Y3			REVIEWED BY (Name, Grade, AFSC)		

PERIODIC CHECKS				
CHECK FREQUENCY <input checked="" type="checkbox"/> ANNUALLY <input type="checkbox"/> QUARTERLY <input type="checkbox"/> OTHER _____				
DATE (DD MMM YY)	SIGNS CURRENT	PROCEDURES ADEQUATE	OTHER	CHECKED BY
09 Sep 01	Y	Y	Current.	Maj Martilla

SYSTEM DIAGRAM. CALCULATIONS. AND MEASUREMENTS

Waveguides and ground level RFR emissions checked in Feb 00 as documented in AFIERA consultative letter, IERA-DO-BR-CL-2000-0066. Survey by Det 3, AFIERA augmentee indicated no accessible RFR emission hazards.

Hazard Control Codes

AS-Audible Signal; BA-Rope or Chain Barrier; CA-Check RF Absorbers; CO-Constant Observation; CW-Check Waveguides; FE-Fence; FL-Flashing Lights; LF-Locked Fence; SC-Special Coordination; SO-SOP; WS-Warning Sign; NR-No Control Required; OM-Other